INNOVATIVE COKE OVEN GAS CLEANING SYSTEM

FOR

RETROFIT APPLICATIONS

QUARTERLY TECHNICAL PROGRESS REPORT NO. 6

FOR THE PERIOD COVERING

APRIL 1, 1991 TO JUNE 30, 1991

PARTICIPANT

Bethlehem Steel Corporation

Bethlehem, PA

Prepared for the United States Department of Energy

Under Cooperative Agreement No. DE-FC22-90PC89658

[Patents Cleared by Chicago on August 19, 1994]

BACKGROUND

Refer to Quarterly Technical Progress Report No. 1, May 24, 1989 to March 31, 1990.

TECHNOLOGY DESCRIPTION

Refer to Quarterly Technical Progress Report No. 1, May 24, 1989 to March 31, 1990.

PROJECT DESCRIPTION

Refer to Quarterly Technical Progress Report No. 1, May 24, 1989 to March 31, 1990.

PROCESS DESCRIPTION

Refer to Quarterly Technical Progress Report No. 1, May 24, 1989 to March 31, 1990.

SUMMARY

Work on this coke oven gas cleaning demonstration project (CCT-II) this quarter has been focused on Phase IIB tasks, and include engineering, construction, and training. Additionally, plans for changes in the operating schedule of the coke plant that affect the demonstration project are described. The project Milestone Schedule and Log is shown in Figure 1.

The currently estimated project cost substantially exceeds the budget. Additional funds will be appropriated by Bethlehem Steel Corporation. Bethlehem will not request additional funding from the U. S. Department of Energy (DOE).

The draft Environmental Monitoring Plan has been reviewed, and the changes suggested by the DOE have been incorporated. Bethlehem is awaiting delivery of the finalized version of the Environmental Monitoring Plan by our subcontractor, Environmental Resources Management, Inc. The Baseline Compliance Monitoring Sampling Program was carried out during the period as required; all samples were collected during the period. Also, all planned Baseline Supplemental Monitoring activities described in the Environmental Monitoring Plan were completed.

Testing of the mechanical systems began in June, 1991.

The cold commissioning date has been moved back from October 1, 1991 to November 1, 1991 to allow float for miscellaneous finish-up items beyond the electrical contractor's projected completion date of October 31, 1991.

ENGINEERING STATUS

Overall engineering status is over 90% complete; engineering drawings and design are essentially complete. Engineering emphasis continues on addressing field installation problems and preparation and finalization of commissioning schedules.

PROCUREMENT STATUS

Procurement of major equipment is complete.

CONSTRUCTION STATUS

Completion of construction is scheduled for November, 1991. The status of construction is shown as follows:

1. Civil, structural and mechanical installation is complete. Piping installation is 67% complete.

2. Installation of the gas mains is basically complete.

3. Except for the distributed process control system, all equipment delivery is complete.

4. Work on the instrumentation and control contract is 49% complete. Work began on the power distribution contract during the quarter and is currently 17% complete.

5. Plant general repair forces are working on pump alignment, light-oil piping and precipitator piping.

6. Plant laborers continue general clean-up.

TRAINING STATUS

Training of the plant operators for system start-up, steady-state operation and maintenance is continuing using an interactive computerized training system developed by RWD Technologies, Inc.

COKE PLANT PRODUCTION PLANS

Despite an extensive wall repair program, the coke plant has been unable to recover lost production capability. Ovens continue to remain off-line. Because of extensive wall damage, they cannot be operated in an environmentally acceptable manner. If this

situation continues it means that the gas cleaning system will be operated at less than design capacity.

PROJECT STATUS

Engineering	Material Ordered	Material Delivered	Construction
90%	99%	95%	58%

ENVIRONMENTAL MONITORING

Objectives. During the period of January 1, 1991 to July 31, 1991, both Baseline Compliance Monitoring and Baseline Supplemental Monitoring Programs were conducted for the winter period according to the schedules and protocols detailed in the Environmental Monitoring Plan.

Collecting compliance monitoring data and supplemental monitoring data during baseline and operational phases of the facility will provide a basis for comparing and estimating the impact of the demonstration facility on the compliance streams and the important process streams. Supplemental monitoring is conducted to demonstrate the effectiveness of the project by providing environmental and process data not available from compliance monitoring. The two main objectives of the supplemental monitoring program are to provide sufficient data to demonstrate the effectiveness of individual unit processes and to demonstrate the effectiveness of the combined processes.

Collecting compliance monitoring data and supplemental monitoring data during a winter and a summer period provides a basis for demonstrating the impact of ambient temperature on the operational and compliance performance of the demonstration facility.

Status. The Baseline Compliance Monitoring Sampling Program was carried out during the period as required by Federal, State and Local regulations. All samples were collected during the period. Also, all planned Baseline Supplemental Monitoring Program activities described in the Environmental Monitoring Plan were completed. In addition, during the period personnel monitoring equipment was acquired to help monitor personnel exposures to hydrogen sulfide, ammonia, carbon monoxide and fugitive hydrocarbons during July and August, 1991.

Results. The analytical results of these Baseline Compliance Monitoring and Supplemental Monitoring Plans will be presented in detail, with an analysis of results as part of the final report of The Baseline Sampling Program Report.

The following is a brief summary of the results of the Baseline Compliance Monitoring Program:

Air Compliance Monitoring. Continuous Opacity monitoring was conducted throughout the period for waste heat stacks for No. 11, No. 12 and 'A' Batteries. The reported opacities for the period ranges from an average of 12 to 20% for No. 11 battery, 16 to 38% for No. 12 Battery and over 90 to 95% for 'A' battery. These opacities readings are due mainly to problems with large cracks in the oven interior walls of these batteries. A major repair program is underway to repair these cracks which will result in a reduction in the stack opacity readings. All of these opacity data were reported to the Maryland Department of Environment in quarterly reports as required.

Water Compliance Monitoring. Outfall 021 compliance monitoring data showed four daily measurements below the Low ph 6.0 limit. These results were reported to the Maryland Department of Environment as required. There were no other exceedances of any limited parameters for this Outfall during the monitoring period.

Water Compliance Monitoring. Monitoring Point 121 is the discharge from the coke oven wastewater biological treatment plant. It is a tributary to Outfall 021. There were no exceedances of any limited parameter at this monitoring point during the monitoring period.

Waste Spills. During the monitoring period there were nine spills reported in the coke plant area that will be affected by the demonstration facility. The materials spilled included ammonia liquor, primary light oil, wash oil, prelimer sludge, saturator acid and oils. None of the spill events contained above the reportable quantity for the materials spilled. The completion of the demonstration facility will eliminate generation of the waste materials and hence eliminate the potential for spills of some of these materials.

Benzene Monitoring. All of the required benzene leak monitoring of the equipment, valves, pumps, etc. was completed during the period and there were no exceedances of the applicable standards.

OSHA Monitoring. All required OSHA personnel monitoring was conducted during the period and the results reported to Coke Plant management. In those areas where the exposure limit was greater than the permissible exposure limit appropriate control measures are undertaken and monitored.

Problems. During the Supplemental Baseline Monitoring Program one sample of ammonia still effluent was not taken because of an unscheduled shutdown of the ammonia still. All other samples were collected and preserved according to agreed upon protocols. Preserved liquid and gas samples were submitted on a daily basis for analysis. Samples submitted in March, 1991 were not analyzed for several months. This long turn around

time on the chemical analysis of samples was unacceptable. As a result, a new contractor for chemical analysis was selected to support the summer round of the Baseline Supplemental Monitoring Program.

FINANCIAL STATUS

Figures 2 and 3 portray actual project costs incurred to date and anticipated project cost. Actual expenditures through June 1991 are higher than planned because of a poor original estimate which did not properly anticipate the full extent of installation and other fieldwork. Also, the inability of the instrumentation and control systems to adequately control existing facilities was not recognized. Additional funds will be appropriated by Bethlehem and no request for additional funds will be submitted to DOE.

PLANS FOR NEXT QUARTER

Obtain approval of an appropriation revision.

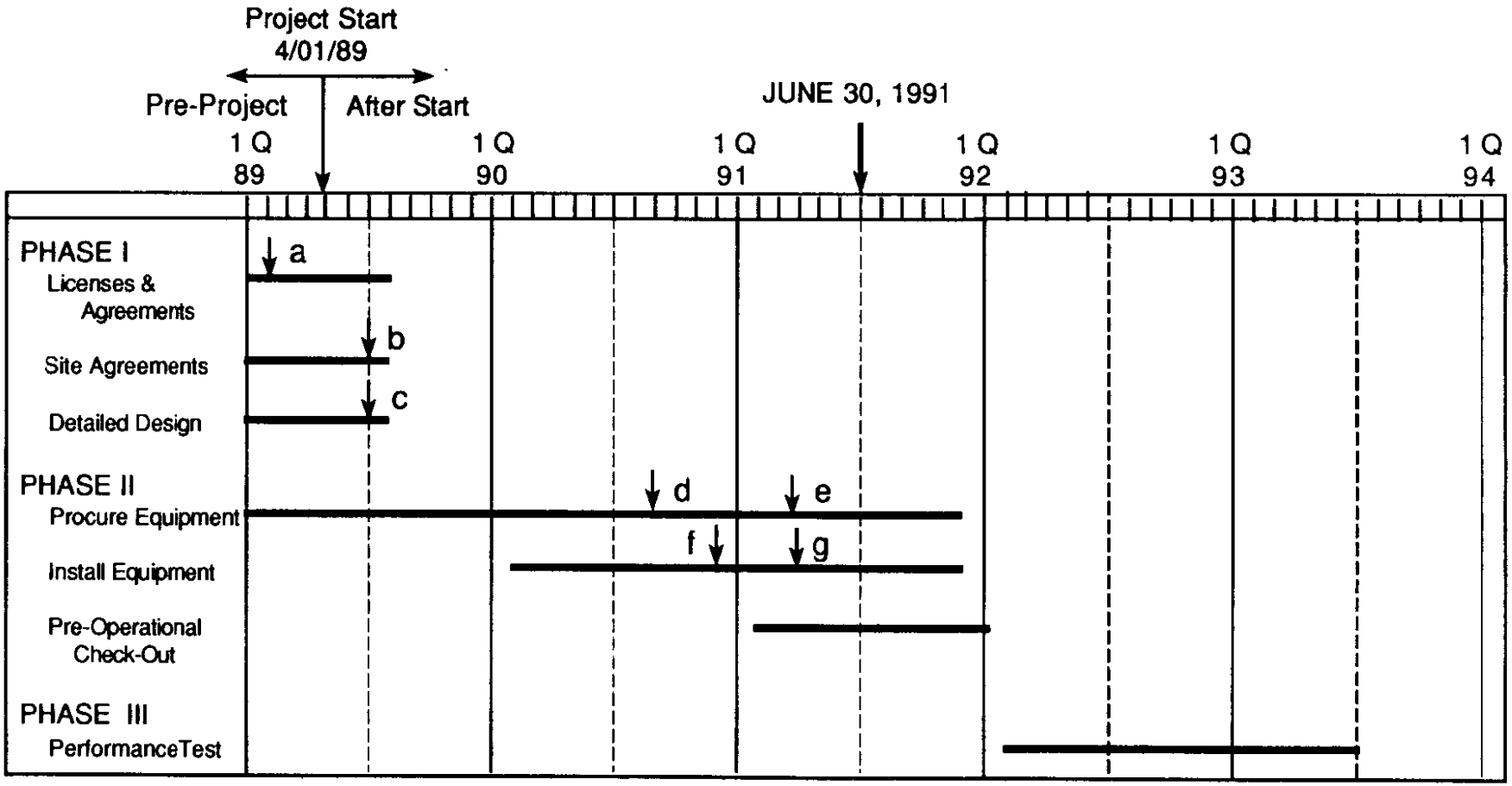
Continue in-plant training activities under the supervision of Davy/Still-Otto's chief start-up engineer.

Figure 1

PROJECT MILESTONE SCHEDULE

CLEAN COAL II PROJECT

SPARROWS POINT, MD.



↓ Designates actual completion of a major milestone, per Project Milestone Log

PROJECT MILESTONE LOG

	Planned Completion Date	Actual Completion Date
PHASE I		
Licenses and Agreements		
a. (Materials, Licenses)	6/30/89	1/28/89
Site Agreements		
b. (Site Agreements)	6/30/89	6/30/89
Detail Design		
c. (BSC Project Engineering)	6/30/89	6/30/89
PHASE II		
Procure Equipment		
d. (Place General Construction Contract)	7/30/90	8/27/90
e. (All Major Equipment on Site)	1/31/91	3/22/91
Install Equipment		
f. (End Foundation Construction)	11/30/90	11/30/90
g. (End Erection of Vessels and Structural Steel)	8/30/91	3/30/91
h. (End Piping Installation	8/31/91	
i. (End Electrical Installation)	10/31/91	
j. (End General Construction)	10/31/91	
Pre-Operational Checkout		
k. (Begun Cold Commission)	10/01/91	
l. (End Cold Commission)	10/31/91	
PHASE III		
Performance Test		
m. (Plant Operation	5/01/93	
n. (Plant Re-assessment)	5/01/93	
o. Complete Demonstration Operation	6/01/93	
p. Issue Final Report	7/01/93	

Figure 2

Quarterly Project Cost vs. DOE Cost Share Through June 30, 1991
Coke Oven Gas Cleaning System for Retrofit Applic.
A&B Coal Chem. Plants, Sparrows Point, MD

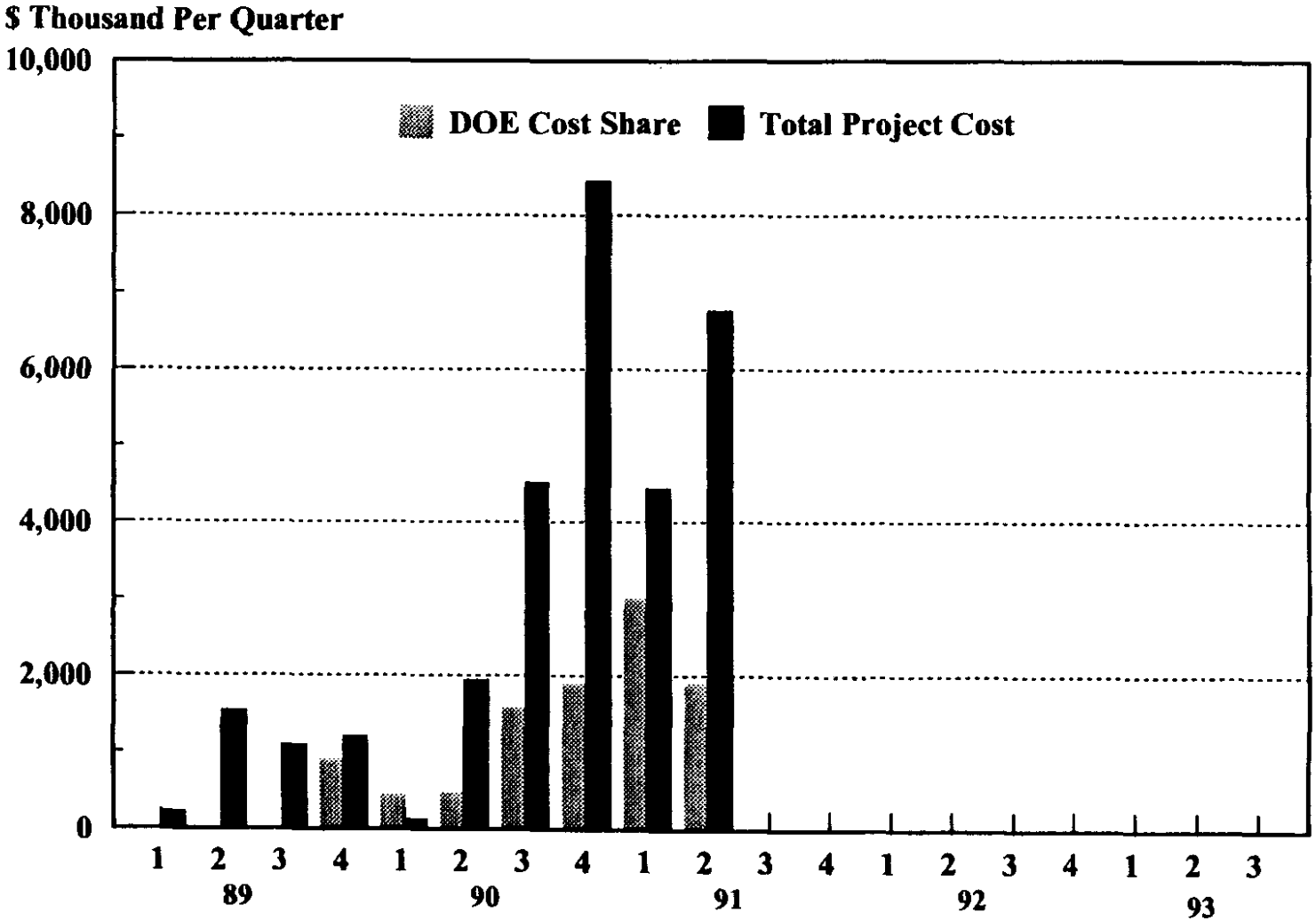
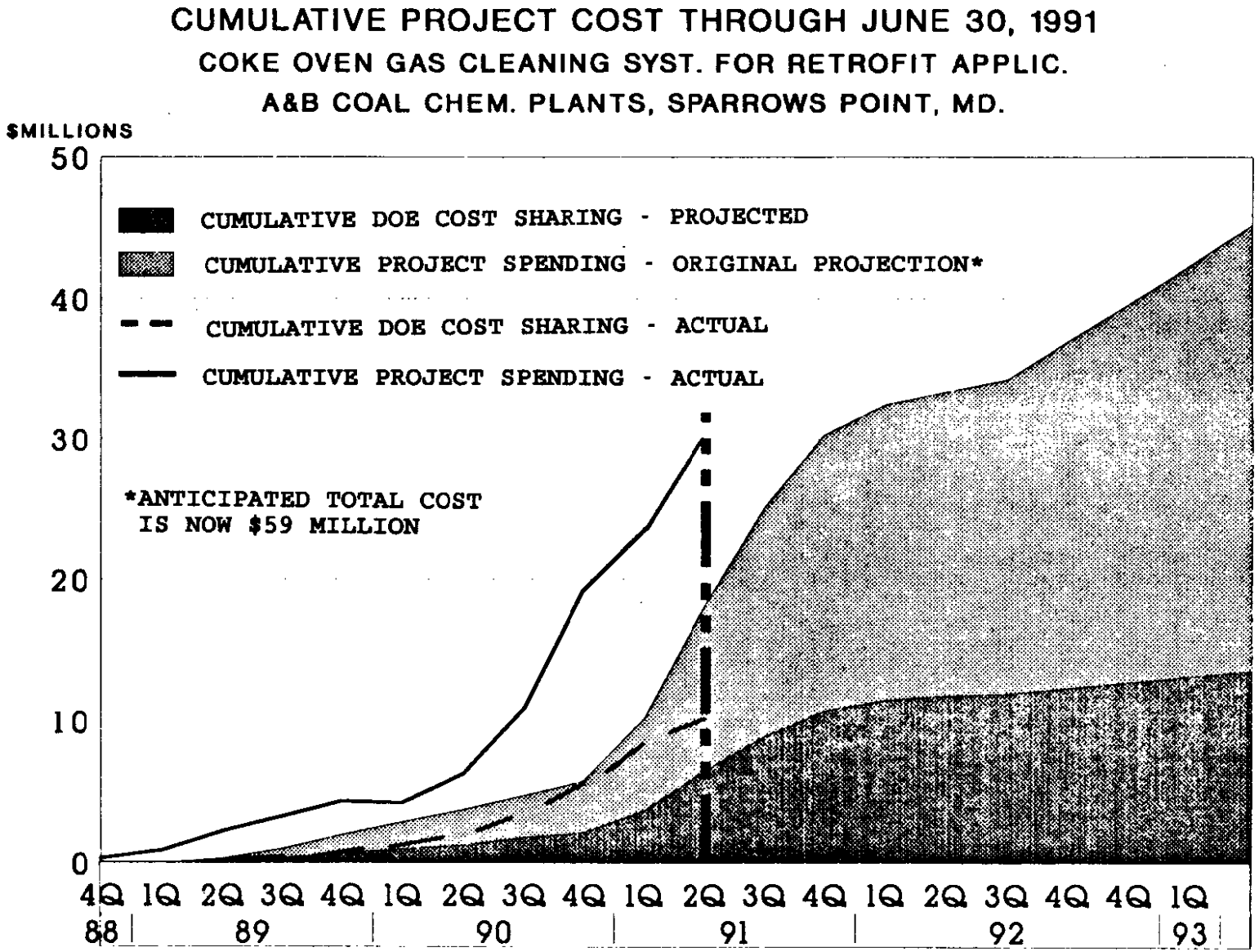


Figure 3


CUMULATIVE PROJECT COST THROUGH JUNE 30, 1991
COKE OVEN GAS CLEANING SYST. FOR RETROFIT APPLIC.
A&B COAL CHEM. PLANTS, SPARROWS POINT, MD.
$MILLIONS
50
40
30
20
10
0
CUMULATIVE DOE COST SHARING - PROJECTED
CUMULATIVE PROJECT SPENDING - ORIGINAL PROJECTION*
CUMULATIVE DOE COST SHARING - ACTUAL
CUMULATIVE PROJECT SPENDING - ACTUAL
*ANTICIPATED TOTAL COST
IS NOW $59 MILLION
4Q 1Q 2Q 3Q 4Q 1Q 2Q 3Q 4Q 1Q 2Q 3Q 4Q 1Q 2Q 3Q 4Q 4Q 1Q
88 89 90 91 92 93